DOCUMENT RESUME

ED 339 296 HE 025 081

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TITLE The Influence of Student Effort, College Environments and Selected Student Characteristics on Undergraduate Student Learning and Personal Development at Metropolitan Institutions. ASHE Annual Meeting Paper.
PUB DATE 2 Nov 91
NOTE 27p.; Paper presented at the Annual Meeting of the Association for the Study of Higher Education (Boston, MA, October 31-November 3, 1991).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS College Students; Educational Environment; Full Time Students; Higher Education; *Individual Development; *Learning; Part Time Students; Student Attitudes; *Student Characteristics; Student Development; Student Motivation; Urban Education
IDENTIFIERS *ASHE Annual Meeting; Cleveland State University OH; College Student Experiences Questionnaire; University of Alabama; University of Louisville KY; University of Lowell MA; University of Toledo OH; Wichita State University KS

ABSTRACT

This study sought to measure what factors contribute to the learning and personal development of traditional and new majority students at six metropolitan institutions: University of Alabama, Birmingham; University of Louisville (Kentucky); Wichita State University (Kansas); University of Lowell (Massachusetts); Cleveland State University (Ohio); and University of Toledo (Ohio). The study used the College Student Experiences Questionnaire (CSEQ) to solicit information on student effort (involvement), student perception of their campus environment, and how much students believe they have gained in certain areas. Demographic information was also obtained on year-in-school, age, and enrollment status. The total number of subjects was 3,084. Results of factor analysis suggested the following conclusions: (1) learning gains of traditional-age full-time students and new majority students are affected by institutional environmental factors and student involvement factors; (2) learning gains are influenced by age and enrollment status; (3) age and enrollment status interact with each other and with involvement and environmental factors to affect gains in learning and personal development. Three appendixes contain CSEQ scales. Includes 21 references and 1 table. (JB)

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ED339296

The Influence of Student Effort, College Environments and Selected Student Characteristics on Undergraduate Student Learning and Personal Development at Metropolitan Institutions

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Presented at the annual meeting of the Association for the Study of Higher Education, Boston, November 2, 1991.

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ASSOCIATION FOR THE STUDY OF HIGHER EDUCATION

This paper was presented at the annual meeting of the Association for the Study of Higher Education held at the Park Plaza Hotel & Towers in Boston, Massachusetts, October 31-November 3, 1991. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

The Influence of Student Effort, College Environments and Selected Student Characteristics on Undergraduate Student Learning and Personal Development at Metropolitan Institutions

Student learning in college takes place in such diverse settings as classrooms, laboratories, libraries, athletic and recreational facilities, student residences, fine arts facilities, and campus unions (Pace, 1988). What and how much students learn, of course, varies from college to college (Pascarella & Terenzini, 1991). Additionally, there is evidence to suggest that the amount of student involvement in various learning activities (time spent studying in the library, for example) may vary more *within* institutional categories (e.g., selective liberal arts, metropolitan institutions) than *between* categories (Pace, 1988; Pascarella & Terenzini, 1991).

Learning and personal development during the college years has received considerable attention, as evidenced by the more than 2,600 studies reviewed by Pascarella & Terenzini (1991). Much of what is known about how college affects students, however, is based primarily on full-time students at residential institutions. Studies aimed at examining and understanding the "new majority" (Ehrlich, 1991) of the college student cohort are limited. New majority students are made up of two groups: (a) those who are older than 25, live off campus, work more than 20 hours per week, have families, and attend college part-time, and (b) traditional-age students of color who live on or off campus. This study addresses the learning and personal development of new majority students, as defined in part (a), who attend metropolitan universities.

Variations in student learning across colleges and universities may be, in part, a function of characteristics of college environments: physical properties including

the use of open space and the size, location, and use of buildings (Gerber, 1989); the ambience created by the behavior and personalities of students (Astin & Holland, 1961); the perceptions of students (Pace, 1984); and the environmental "press" (Stern, 1970) or expectations established by dominant student (Clark & Trow, 1966) or faculty groups. Because environmental stimuli consistently elicit and reinforce certain behaviors (Barker, 1968; Moos, 1976), people tend to exhibit consistent patterns of behavior in particular settings (Bandura, 1977; Barker, 1968).

The college outcomes literature (e.g., Astin, 1977; Feldman & Newcomb, 1969; Pascarella & Terenzini, 1991) indicates that institutions which clearly and consistently express their educational purposes seem to be able to shape desirable student behavior and foster interactions among people who are basically supportive of the institution's purposes (Baird, 1988). That is, institutions with salient missions create expectations for how students are to spend their time (e.g., studying or socializing) and how much effort is required to be academically and socially successful (Kuh, Schuh, Whitt, Andreas, Lyons, Strange, Krehbiel & MacKay, 1991; Pascarella & Terenzini, 1991).

Further, Pascarella and Terenzini (1991) found two persistent themes regarding the effects of college: (a) the frequency and quality of students' relationships with institutional agents and peers; and (b) the time and effort students devote to various activities such as studying, talking with faculty and peers about academic matters, and taking advantage of such resources as the library or recreational facilities. These authors suggest that while "...the weight of the evidence indicates that the links between involvement and change to be specific, the greatest impact may stem from the student's total level of campus engagement..." (Pascarella & Terenzini, 1991, p. 626). In other words, students who take advantage of different kinds of learning and personal development opportunities inherent in collegiate

environments (e.g., library, laboratories, theatre, social organizations) benefit more than those who don't.

Taken together, these perspectives suggest that student learning and personal development are significantly affected by two sets of factors: (a) such institutional environmental characteristics as the quality of relationships between student peers and faculty, and (b) characteristics of student involvement or effort, such as time spent studying in the library or participating in educational programs in the union building or residence hall.

Not only are the preceding notions intuitively appealing, they have also been empirically confirmed (Pascarella & Terenzini, 1991). However, the observation that student learning is dependent on these factors is, arguably, more appropriate for students at residential institutions where students are more likely to interact with agents of socialization and other significant aspects of the institution's environment. Full-time students in residence simply have more opportunities for involvement in the life of the institution. Metropolitan institutions, though, attract high proportions of commuter, part-time and older students. Such characteristics as age, residence and enrollment status (part-time *vs.* full-time) likely influence a student's relationship to the institution and the degree to which he or she has access to institutional resources that foster learning and personal development. These particular characteristics of new majority students likely influence the way that the institution's environment is perceived and the amount of time available to invest in learning activities. For example, a university environment that is experienced as supportive by a residential student may be seen as inhospitable by a part-time, commuter student who only may be on campus in the evenings, when offices supplying administrative services and developmental programs are usually closed. Students over the age of 25, with competing life commitments such as family, job,

community, or church, potentially have little discretionary time to devote to campus-based cultural activities such as theatre or opera; hence, little opportunity for the learning and development associated with such activities may exist. These considerations lead us to believe that, when examining learning and personal development gains for students at metropolitan institutions, the influence of such student characteristics as age and full- or part-time enrollment status must be considered.

In sum, the preceding arguments suggest that the learning gains of students at metropolitan institutions can be expressed as a combination of environmental factors, student involvement (effort) factors, and student characteristics such as age and enrollment status — including the effects of age and enrollment status interacting with perceptions of college environment and student involvement.

A simple linear model (Kuh, Arnold & Vesper, 1991) is suggested:

Gains = institutional environment
+ student involvement
+ student characteristics.

We believe that we have means of approximating these measures in order to explain the effects of such factors on student learning at metropolitan institutions. If the effects of these factors can be better understood, it may be possible for faculty members, academic and student affairs administrators, and others to modify policies and practices at metropolitan institutions in order to enhance the learning and personal development of their students.

Purpose

The purpose of this investigation was to examine how student involvement in campus activities, student perceptions of their college environment, and student characteristics work together to influence student learning at metropolitan institutions. More specifically, the question guiding this study was: *what factors contribute to the learning and personal development of traditional and new majority students at metropolitan institutions?*

Methods

Instrument

The instrument employed in this investigation was the *College Student Experiences Questionnaire (CSEQ)* (Pace, 1984). This questionnaire solicits information in three areas: student effort (involvement), student perceptions of their campus environment, and an estimate how much students believe they have gained in certain areas. Demographic information is also obtained, including such characteristics as year-in-school, age, and enrollment status.

The *CSEQ* Quality of Effort scales reflect student involvement by measuring how often students engage in such activities as studying, use of the library, use of recreational facilities, and talking with peers and faculty about academic matters or personal concerns (Appendix A). The *CSEQ* has 14 such scales made up of multiple items (each with a four-point rating scale: 4=very often, 3=often, 2=occasionally, 1=never). Because not all undergraduates are able to live in a residence hall or join a fraternity or sorority, this scale was omitted from the analysis per Pace's (1987)

suggestion.

The *CSEQ* College Environment Scales seek student perceptions of their campus (Appendix B). Five of the seven-point rating scales (from 7=strong emphasis to 1=weak emphasis) refer to the extent to which students perceive that the environment emphasizes certain aspects of learning (scholarship, estheticism, critical thinking, vocational competence, practical relevance of courses); the remaining three scales refer to relationships among students, faculty, and administrators.

The 21 Estimate of Gains scales from the *CSEQ* consist of student ratings of progress toward important educational goals (Appendix C). According to Pace (1988), these goals are frequently mentioned in the higher education literature and have been used in national surveys over the past several decades; additionally, self-reported information with respect to gains in these areas is typically given with great care by students and all evidence leads to the belief that the information is credible. As with the Quality of Effort scales, the Estimate of Gains scales are scored on a four-point rating scale (4=very much, 3=quite a bit, 2=some, 1=very little).

Data Sources

CSEQ data for students at six metropolitan institutions were used in this study. For three of the metropolitan institutions (University of Alabama — Birmingham, University of Louisville, Wichita State University), *CSEQ* data were gathered under the auspices of the College Experiences Study (Kuh, et al., 1991). The *CSEQ* data for the remaining three institutions (University of Lowell, Cleveland State University, University of Toledo) was furnished by C. Robert Pace, University of California — Los Angeles. Valid cases for each of the institutions were (N = 3,084):

University of Alabama —Birmingham	316
University of Louisville	317
Wichita State University	209
University of Lowell	817
Cleveland State University	1,082
University of Toledo	343

As will be outlined below, the data were examined to estimate the influences of age and enrollment status on student learning. Valid cases in particular subsets of the total population were:

Students age 22 and younger	1,962
Students age 28 and older	523
Full-time students	2,188
Part-time students	297

Data Analysis

Taken together, the relationships among the 13 Quality of Effort, 8 College Environment, and the 21 Estimate of Gains scales are too numerous to meaningfully examine and interpret. Hence, factor analysis (as recommended by Pace, 1987) was used to reduce these sets of variables to a more manageable number. Factor definitions and their component *CSEQ* scales follow.

The Estimate of Gains scales were reduced to five Gains Factors (Pace, 1987):

PERS & SOC	Personal and social development
	SELF+OTHERS+VALUES+TEAM+HEALTH
SCI & TECH	Science and technology
	SCI+SCI/TECH+CONSQ S/T
ED, LIT & ART	General education, literature and the arts
	GENLED+LIT+ARTS+WRITE+PHILS

INTEL SKILLS	Intellectual skills
	ANALY+SYNTH+QUANT+INQ
VOC PREP	Vocational preparation
	VOC+CAREER+SPEC

The Quality of Effort scales were reduced to four Involvement Factors (Pace, 1987):

QE ACAD	Academic activities
	LIB+FAC+COURSE+WRITE
QE INTERPERS	Informal personal activities
	AMT+PERS+STACQ+CONTPS+CON INFO
QE GRP FACIL	Activities related to groups and facilities
	UNION+ATHL+CLUBS
QE SCI	Activities related to science
	SCI

The College Environment scales were reduced to three Environmental Factors (Pace, 1987):

ENV RELATS	Supportive personal relationships
	STU+FAC+ADM
ENV SCHOL	Scholarly, intellectual emphasis
	SCH+ESTH+CRIT
ENV VOC	Vocational, practical emphasis
	VOC+PRAC

In addition to having been established empirically (Pace, 1987), these factors also appear conceptually and intuitively valid. That is, those scales expected *a priori* to be highly correlated do, indeed, group together in sensible ways.

Three sets of independent variables were employed. The first two sets, described

above, correspond to the *CSEQ* categories of student involvement (from the Quality of Effort Scales) and campus environment (from the College Environment Scales).

The third set of independent variables was based on student characteristics of age (AGE: all those 22 years or younger, coded with a value of 0; those 28 years or older, coded 1) and enrollment status (TIME: full-time, coded 0; part-time, coded 1). Interaction factors were produced as part of this set of variables by multiplying all age and full-/part-time status codes by the Quality of Effort (QE) and Environment (ENV) factor values. In general, interaction effects (Lewis-Beck, 1980) are operative when the contribution of one independent variable to the regression curve is dependent upon the value of another independent variable. In this study, interaction factors were employed to examine the impact of age and enrollment status *in combination with* effort and environment because, as previously discussed, we believed their impacts on student learning to be mutually dependent.

The dependent variables consisted of the five Gains Factors described above.

Because a linear model was employed, OLS multiple regression analyses (five, one for each Gains Factor) were conducted. All independent variables were entered first and then removed one at at time to improve overall model fit and variable significance. With each Gains Factor used as a dependent variable, independent variables consisted of (a) the four Involvement (QE) Factors, (b) the three Environment (ENV) Factors, and (c) the complete set of Student Factors (described above). After an initial regression to determine the most significant of the Student Factors for each Gains Factor, a second regression was conducted with a reduced number of variables.

Results

The results of all five regression analyses are presented in Table 1 (p. 21). The R^2 values range from 0.284 to 0.376, verifying the reasonableness of the assumption of a linear model. Table 1 contains three sections for each Gains Factor regression, corresponding to the sets of independent variables. As previously mentioned, traditional-age and full-time students were coded 0 (zero). Therefore, where the additive student variables (AGE, TIME) appear in the regression equation, the positive or negative impacts or age, enrollment status, or the interaction of those variables with ENV or QE are for non-traditional (age 28 or older) or part-time students. A multiplicative Student Factor is indicated by a term such as TIME ⊗ ENV VOC — which, in this case, is the interaction of a student's full/part-time status with their perceptions of the vocational environment of the institution.

The regression results for the five Gains Factors are now discussed in turn emphasizing the impacts of age, enrollment status and interaction effects.

Gains in Personal and Social Development (PERS & SOC)

The small, but significant, negative value for AGE (beta = -0.09) indicates a smaller gain for older students in personal and social dimensions compared to traditional students. The combination of non-traditional status and part-time (beta = 0.08), however, contributes positively to gains in this area. The small negative value for TIME ⊗ ENV VOC (beta = -0.07) suggests a smaller contribution of the vocational, practical emphasis of the campus environment to personal and social gains for non-traditional students compared to traditional students.

Gains in Science and Technology (SCI & TECH)

The negative value for AGE (beta = -0.11) indicates that non-traditional students

gain less in this area than do traditional students. However, the value of AGE ⊗ QE SCI (beta = 0.15) suggests that the pay off per unit of effort expended in this area is greater for older students compared to younger students.

Gains in General Education, Literature and Arts (ED, LIT & ART)

The positive value for TIME (beta = 0.23) indicates that part-time students gain more in this area; however, part-time student gains (TIME ⊗ ENV SCHOL, beta = -0.21) covary with the scholarly, critical emphasis of the campus. The AGE variable interacts with both QE and ENV variables indicating that older students tends to gain more in general education, literature and the arts if they invest more effort in informal, interpersonal relationships (AGE ⊗ QE INTERPERS, beta = 0.25) and if they perceive their campus to have a scholarly, critical emphasis (AGE ⊗ ENV SCHOL, beta = 0.24). However, the older student may experience relatively smaller gains the greater their effort in purely academic pursuits (AGE ⊗ QE ACAD, beta = -0.30) and the greater the vocational, practical emphasis of the campus environment (AGE ⊗ ENV VOC, beta = -0.17).

Gains in Intellectual Skills (INTEL SKILLS)

Enrollment status of a student is significantly related to gains in intellectual skills. From the relatively large (beta = 0.24) value of TIME ⊗ ENV REL, part-time students gains in this area are enhanced more by positive, supportive relationships with peers, faculty, and administrators than are full-time students. However, at campuses with a perceived scholarly, critical emphasis, part-time students experience relatively smaller gains (TIME ⊗ ENV SCHOL, beta = -0.19).

Gains in Vocational Preparation (VOC PREP)

The value of TIME (beta = 0.28) suggests that part-time students experience greater gains in vocational preparation in comparison to their full-time colleagues. However, the more time a part-time student devotes to informal, interpersonal

activities (TIME ⊗ QE INTERPERS, beta = -0.23) or the greater the perceived vocational, practical emphasis of the campus (TIME ⊗ ENV VOC, beta = -0.17), the smaller the gains in this area. At institutions that have more of a scholarly, critical emphasis, older students tend to exhibit greater gains (AGE ⊗ ENV SCHOL, beta = 0.18).

Discussion

The focus of this study was to determine how learning gains of students at metropolitan institutions are influenced by such characteristics as age and enrollment status, as well as environmental and involvement factors. The following discussion concentrates on the impact of the Student Factors, which includes the effects of age and enrollment status combining with the environmental and involvement factors.

The Effects of Student Age

As noted above, AGE appears as a suppressor variable in the regression curves for both PERS & SOC and SCI & TEC, indicating that students age 28 and older tend to experience gains in these areas that are smaller than those students 22 and younger. The effect for PERS & SOC, though small, is significant ($p<0.001$) and may be explained by the notions that because non-traditional students generally have more life experience, and because their personal and social needs are likely met externally, their college experience contributes less to gains in personal and social dimensions compared with traditional students. Also, those students 28 and older

generally may be motivated most in academic areas and toward the goal of receiving a credential, aspirations that may not be necessarily congruent with personal and social development. This result is slightly at odds with the finding that AGE ⊗ TIME contributes positively to PERS & SOC, an indication that *part-time* students over age 28 do experience greater gains in personal and social development.

Students 28 and older, similarly, experience smaller gains in science and technology than younger students. The results indicate, however, that given the effort non-traditional students expend in science areas (AGE ⊗ QE SCI), they benefit more (i.e., experience greater gains) than traditional students. Thus, though the age of a student does seem to matter when considering gains — especially in the areas of PERS & SOC and SCI & TEC — the age factor interacts in interesting and not altogether easily explainable ways with other variables.

The Effects of Enrollment Status

As previously indicated, TIME appears with a relatively large beta weight in the regression equations for gains in both general education, literature and the arts (ED, LIT & ART) and vocational preparation (VOC PREP). Part-time students, then, tend to experience greater gains in these areas than full-time students. Part-time students typically have a variety of other, non-school activities competing for time and attention, many or most of which have higher priority in their day-to-day lives. However, compared to full-time students, this cohort experiences greater gains in the areas of ED, LIT & ART and VOC PREP for the time they are able to spend on school. Perhaps the structure that this group must impose upon their lives to balance multiple commitments requires considerable skills in time management and more learning per unit of time devoted to the activity.

Interaction Effects

Interaction factors appear several times in the five regression curves presented in Table 1. The following discussion focuses on two of these interaction effects and how they may be interpreted.

AGE ⊗ QE INTERPERS appears with a relatively large beta weight in the regression curve for ED, LIT & ART. By itself, QE INTERPERS (effort expended by students in informal, interpersonal activities) makes a significant contribution to gains in general education, literature and the arts (beta = 0.33, $p<0.001$), suggesting that the vast majority of students tend to experience gains in this area corresponding to time spent in contact with peers in such activities as talking over personal issues and attending theatre and concert events. This finding appears consistent with other work (Bean, 1985) that suggests relations with one's peers are as important to student learning in some areas as are relationships with faculty. The regression results presented for ED, LIT & ART indicates that time spent in interaction with other students can be of particular importance for students 28 or older. Therefore, should a metropolitan institution identify a need or desire to increase non-traditional student learning gains in general education, literature and the arts, it may want to take steps to encourage the participation of these students in activities that will maximize interaction with other students in an informal manner (e.g., collaborative learning activities).

Of course, encouraging student interaction among peers is difficult because, for many of these individuals, their "student role" is but one of several competing priorities in their lives, as previously noted. To encourage student learning, metropolitan institutions and other colleges that have high numbers of non-traditional students could structure more opportunities for students to come together when they are on the campus. For example, by scheduling guest lectures

over the noon hour followed by a colloquium (with childcare provided for the entire event) and perhaps requiring attendance for certain speakers or events as part of the course grade, student interaction with peers can be encouraged through the curriculum as well as through out-of-class experiences (Jacoby, 1989). Additionally , the use of small groups during class time to process assigned material and the implementation of out-of-class study groups are ways that interactions with peers can be encouraged, or even required, in order to maximize learning gains.

TIME ⊗ ENV RELATS appears with a relatively large, and highly significant, beta weight in the regression curve for INTEL SKILLS. Although ENV RELATS (a campus environment perceived to provide personal support to students through their relationships with peers, faculty and administrators) does not contribute to gains in intellectual skills for full-time traditional students, ENV RELATS can be a highly significant factor for part-time students. A campus perceived as hospitable by full-time students is sometimes seen as "chilly" or unaccommodating by a part-time, evening students. Perhaps metropolitan institutions should audit their policies and practices to determine if they facilitate or inhibit student learning.

Some environmental modifications that might promote learning at metropolitan institutions include: (1) scheduling office hours —administrative and academic — at night for the convenience of evening-only students; (2) streamlining the registration process so that countless hours of standing in line are avoided (telephone registration, use of credit cards, weekend registration, are examples); (3) providing special support programs for new majority students (e.g., seminars for adult learners, special advising, scholarships for adults who are thinking about returning to school so they may "experiment" with a course or two, etc.); and (4) encouraging families of adult learners to attend campus events with

the student (e.g., sporting events, use of recreational facilities, and other campus activities provided with special dispensation to families of students).

Finally, because interaction with peers at metropolitan institutions is more likely to take place in academic settings (classroom buildings, library), opportunities for students and students and faculty to come together prior to or immediately following class can be important. Placing benches and chairs in the hallways of academic buildings and providing student lounges or snack bars in academic facilities is another way that metropolitan institutions might be perceived as friendlier and may encourage their students to learn from one another, and from faculty, and continue class discussions beyond the classroom (Kuh, et al., 1991).

Conclusion

In this study, we examined learning gains for students at metropolitan institutions and focused on those populations for which little is known: part-time students and those age 28 and older. Based on the results of this study, three conclusions are warranted:

(1) *Learning gains of traditional-age full-time students* and *new majority students are affected by institutional environmental (ENV) factors and student involvement (QE) factors.* The regression results presented in Table 1 suggest that all students at these institutions experience learning gains which are a function of environmental and involvement factors.

(2) *Learning gains are influenced by age and enrollment status.* For part-time students and those over the age of 28, additional factors contribute to gains in learning and personal development. Sometimes the influences of these student characteristics are positive, sometimes they are negative. For example, *part-time students gain more* in general education, literature and the arts (ED, LIT & ART) and vocational preparation (VOC PREP) than do full-time students; *students 28 and older gain less* in personal and social dimensions (PERS & SOC) and in science and technology (SCI & TEC) than do students 22 and younger.

(3) *Age and enrollment status interact with each other and with involvement and environmental factors to affect gains in learning and personal development.* The regression analyses considered interaction effects in order to discover how learning gains are influenced by environmental and involvement factors in combination with age and enrollment status. These interaction factors appear to influence student gains in significant ways, sometimes validating what we know (or think we know) about "new majority" students, and sometimes producing results which are not easily explained. One example, previously noted, is that students 28 or older who engage in informal interpersonal activities outside the classroom tend to especially benefit in general education, literature and the arts.

This investigation has attempted to illuminate how student learning gains are impacted at metropolitan institutions by factors of involvement, environment, and student characteristics related to their age and enrollment status. Additional research is needed in order to more fully understand the "new majority" student as this group is defined in the 1990s. Some areas to be explored include:

(1) *Intentionality* — the experiences of students enrolled in degree programs *vs.* those enrolled for enrichment purposes. Perhaps the wants, needs and expectations of these groups of students differ. If so, how? What campus resources are necessary to provide richer and more meaningful experiences for both groups?

(2) *Gender* — the experiences of men *vs.* women. It is commonly believed that returning adult men receive more family support and encouragement than returning women. How does this affect the collegiate experience of each group?

(3) *Race and ethnicity* — the experiences of students of color. What are the most effective methods for enhancing learning in metropolitan university settings for members of racial and ethnic minorities? How does the increasingly multicultural profile of our campuses (commuter and residential, large and small) affect campus life?

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Table 1. **Metropolitan Institutions: Gains Factors**
Regression Analysis
(Beta Weights)

	PERS & SOC		SCI & TECH		ED, LIT & ART		INTEL SKILLS		VOC PREP	
INVOLVEMENT FACTORS										
QE ACAD		0.11**				0.27**		0.21**		0.24**
QE INTERPERS		0.25**		0.10**		0.33**		0.13**		
QE GRP FACIL		0.20**								
QE SCI				0.51**		-0.14**		0.26**		0.16**
ENVIRONMENT FACTORS										
ENV RELATS		0.11**				0.06*				0.11**
ENV SCHOL		0.07*		0.08**		0.18**		0.15**		
ENV VOC		0.14**		0.08**				0.09**		0.27**
STUDENT FACTORS										
	AGE	-0.09**	AGE	-0.11	TIME	0.23	TIME ⊗ ENV REL	0.24**	TIME	0.28
	AGE ⊗ TIME	0.08	AGE ⊗ QE SCI	0.15*	TIME ⊗ ENV SCH	-0.21	TIME ⊗ ENV SCH	-0.19*	TIME ⊗ QE INTER	-0.23
	TIME ⊗ ENV VOC	-0.07			AGE ⊗ QE ACAD	-0.30			TIME ⊗ ENV VOC	-0.17
					AGE ⊗ QE INTER	0.25			AGE ⊗ ENV SCH	0.18*
					AGE ⊗ ENV SCH	0.24				
					AGE ⊗ ENV VOC	-0.17				
N		1769		1795		1780		1765		1796
R^2		0.356		0.376		0.351		0.293		0.284

Non-asterisked values, $p<0.05$; *$p<0.01$; **$p<0.001$

Appendix A

CSEQ QUALITY OF EFFORT SCALES

LIB	Library Experiences such as asking the librarian for help or using specialized bibliographies.
FAC	Experiences with Faculty such as visiting informally with an instructor or working on a faculty project.
COURSE	Course Learning such as listening attentively in class or doing additional readings on course topics.
AMT	Art, Music, Theater such as visited an art gallery or worked on a theatrical production.
UNION	Student Union such as met friends at the union or went to hear a speaker.
ATHL	Athletic and Recreation Facilities such as used the gym for individual activities or played on an intramural team.
CLUBS	Clubs and Organizations such as attending an event by a student group or committee work.
WRITE	Experiences in Writing such as spending five hours writing a paper or submitted an article for publication.
PERS	Personal Experiences such as telling your personal reactions to a friend or talking to a counselor.
STACQ	Student Acquaintances such as made friends with student of different interests or discussions with international students.
SCI	Science/Technology such as memorizing formulas or writing a computer program.
CONTPS	Topics of Conversation such as talking about jobs, money, careers or social and ethical issues.
CONINFO	Information in Conversations such as explore different ways to think about a topic or persuading a friend to change his or her mind.

Appendix B

CSEQ COLLEGE ENVIRONMENT SCALES

SCH	Emphasis on the development of academic, scholarly, and intellectual qualities.
ESTH	Emphasis on the development of esthetic, expressive, and creative qualities.
CRIT	Emphasis on being critical, evaluative, and analytical.
VOC	Emphasis on the development of vocational and occupational competency.
PRAC	Emphasis on the personal relevance and practical values of your courses.
STU	Relationships with other students, student groups, and student activities.
FAC	Relationships with faculty members.
ADM	Relationships with administrative personnel and offices.

Appendix C

CSEQ ESTIMATE OF GAINS SCALES

VOC	Vocational training--acquiring knowledge and skills applicable to a specific job or type of work.
SPEC	Acquiring background and specialization for further education in some professional, scientific, or scholarly field.
GENLED	Gaining a broad general education about different fields of knowledge.
CAREER	Gaining a range of information that may be relevant to a career.
ARTS	Developing an understanding and enjoyment of art, music and drama.
LIT 2	Broadening your acquaintance and enjoyment of literature.
WRITE	Writing clearly and effectively.
CMPTS	Acquiring familiarity with the use of computers.
PHILS	Becoming aware of different philosophies, cultures, and ways of life.
VALUES	Developing your own values and ethical standards.
SELF	Understanding yourself--your abilities, interests, and personality.
OTHERS	Understanding other people and the ability to get along with different kinds of people.
TEAM	Ability to function as a team member.
HEALTH	Developing good health habits and physical fitness.
SCI	Understanding the nature of science and experimentation.
SCI/TECH	Understanding new scientific and technical developments.
CONSQ S/T	Becoming aware of the consequences (benefits/hazards/dangers/values) of new applications in science and technology.
ANALY	Ability to think analytically and logically.
QUANT	Quantitative thinking--understanding probabilities, proportions, etc.
SYNTH	Ability to put ideas together, to see relationships, similarities, and differences between ideas.
INQ	Ability to learn on your own, pursue ideas, and find information you need.